



# Day 0: Mean, Median, and Mode

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## Objective

In this challenge, we practice calculating the *mean*, *median*, and *mode*. Check out the [Tutorial](#) tab for learning materials and an instructional video!

## Task

Given an array,  $X$ , of  $N$  integers, calculate and print the respective *mean*, *median*, and *mode* on separate lines. If your array contains more than one *modal value*, choose the numerically smallest one.

**Note:** Other than the modal value (which will always be an integer), your answers should be in decimal form, rounded to a scale of 1 decimal place (i.e., 12.3, 7.0 format).

## Input Format

The first line contains an integer,  $N$ , denoting the number of elements in the array.  
The second line contains  $N$  space-separated integers describing the array's elements.

## Constraints

- $10 \leq N \leq 2500$
- $0 < x_i \leq 10^5$ , where  $x_i$  is the  $i^{th}$  element of the array.

## Output Format

Print 3 lines of output in the following order:

- Print the *mean* on a new line, to a scale of 1 decimal place (i.e., 12.3, 7.0).
- Print the *median* on a new line, to a scale of 1 decimal place (i.e., 12.3, 7.0).
- Print the *mode* on a new line; if more than one such value exists, print the numerically smallest one.

## Sample Input

```
10
64630 11735 14216 99233 14470 4978 73429 38120 51135 67060
```

## Sample Output

```
43900.6
44627.5
4978
```

## Explanation

### Mean:

We sum all  $N$  elements in the array, divide the sum by  $N$ , and print our result on a new line.

$$\mu = \frac{x_0 + x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9}{10} = \frac{439006}{10} = 43900.6$$

### Median:

To calculate the median, we need the elements of the array to be sorted in either non-increasing or non-decreasing order. The sorted array  $X = \{4978, 11735, 14216, 14470, 38120, 51135, 64630, 67060, 73429, 99233\}$ . We then average the two middle elements:

$$\text{median} = \frac{x_4 + x_5}{2} = \frac{89255}{2} = 44627.5$$

and print our result on a new line.

**Mode:**

We can find the number of occurrences of all the elements in the array:

```
4978 : 1
11735 : 1
14216 : 1
14470 : 1
38120 : 1
51135 : 1
64630 : 1
67060 : 1
73429 : 1
99233 : 1
```

Every number occurs once, making 1 the maximum number of occurrences for any number in  $X$ . Because we have multiple values to choose from, we want to select the smallest one, 4978, and print it on a new line.

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Solved score: 30.00pts

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Max Score: 30

Difficulty: Easy

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Current Buffer (saved locally, editable)  

Python 3



```
1 n = int(input())
2 arr = map(int, input().split())
3 arr = list(arr)
4 mean = sum(arr)/n
5 arr.sort()
6
7 m = int((n-1)//2)
8 median = arr[m] if n%2 != 0 else ((arr[m]+arr[m+1])/2)
9
10 modal_dict = {}
11 for i in arr:
12     modal_dict[i] = modal_dict.get(i, 0) + 1
13 modes = [m for m in modal_dict.keys() if modal_dict[m] == max(modal_dict.values())]
14 mode = min(modes)
15
16 print("%.1f \n%.1f \n%d" % (mean, median, mode))
```

Line: 1 Col: 1

 [Upload Code as File](#) ☐ Test against custom input

Run Code

Submit Code